

# Basic Conversion Ratios

**Metric  
Units**

## Linear - Distance - Displacement

(US-US)	(US-Metric)	(Metric Conversions)	
$\frac{12 \text{ in}}{1 \text{ ft}}$ $\frac{3 \text{ ft}}{1 \text{ yd}}$ $\frac{5280 \text{ ft}}{1 \text{ mi}}$	$\frac{1 \text{ in}}{2.54 \text{ cm}}$ $\frac{3.28 \text{ ft}}{1 \text{ m}}$ $\frac{1 \text{ mi}}{1.61 \text{ km}}$	$\frac{100 \text{ cm}}{1 \text{ m}}$ $\frac{1000 \text{ m}}{1 \text{ km}}$	<b>meters (m)</b>

## Area

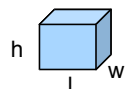
(US-US)			<b>square meters (m²)</b>
$\frac{144 \text{ in}^2}{\text{ft}^2}$ $\frac{9 \text{ ft}^2}{1 \text{ yd}^2}$	$\frac{1 \text{ in}^2}{6.45 \text{ cm}^2}$ $\frac{10.76 \text{ ft}^2}{1 \text{ m}^2}$ $\frac{1 \text{ mi}^2}{2.59 \text{ km}^2}$		

## Volume

(US-US)	<b>Liquid</b>	(US-Metric)	<b>Liquid</b>	(Metric Conversions)	<b>Liters (L)</b>
$\frac{128 \text{ fl oz}}{1 \text{ gal}}$ $\frac{16 \text{ fl oz}}{1 \text{ pt}}$ $\frac{4 \text{ qt}}{1 \text{ gal}}$		$\frac{1 \text{ gal}}{3.79 \text{ L}}$ $\frac{33.81 \text{ fl oz}}{1 \text{ L}}$ $\frac{1 \text{ fl oz}}{29.6 \text{ mL}}$		$\frac{1000 \text{ mL}}{1 \text{ L}}$	
	<b>Solid</b>	(US-Metric)	<b>Solid</b>	<b>Solid to Liquid</b>	<b>cubic meters (m³)</b>
$\frac{1728 \text{ in}^3}{1 \text{ ft}^3}$ $\frac{27 \text{ ft}^3}{1 \text{ yd}^3}$		$\frac{1 \text{ in}^3}{16.39 \text{ cm}^3}$ $\frac{35.31 \text{ ft}^3}{1 \text{ m}^3}$		$\frac{1 \text{ m}^3}{1000 \text{ L}}$ $\frac{1 \text{ cm}^3}{1 \text{ mL}}$	

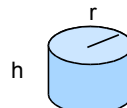
## Cube

$$V = l * w * h$$



## Cylinder

$$V = \pi * r^2 * h$$



## Sphere

$$V = \frac{4}{3} * \pi * r^3$$



## Time

$\frac{60 \text{ s}}{1 \text{ min}}$ $\frac{60 \text{ min}}{1 \text{ hr}}$ $\frac{3600 \text{ s}}{1 \text{ hr}}$			<b>seconds (s)</b>
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## Mass

(US-US)	(US-Metric)	(Metric Conversion)	<b>kilograms (kg)</b>
$\frac{1 \text{ lbm}}{16 \text{ oz}}$	$\frac{2.20 \text{ lb}}{1 \text{ kg}}$ $\frac{1 \text{ oz}}{28.35 \text{ g}}$	$\frac{1000 \text{ g}}{1 \text{ kg}}$	

## Force

(US-Metric)		(Metric Equivalents)	<b>Newtons (N)</b>
$\frac{4.44 \text{ N}}{1 \text{ lbf}}$		$\frac{1 \text{ N}}{1 \text{ J / m}}$ $\frac{1 \text{ N}}{1 \text{ kg-m/s}^2}$	

## Speed - Velocity

(US-US)	(US-Metric)		<b>meters per sec (m/s)</b>
$\frac{1.47 \text{ ft/s}}{1 \text{ mi/hr}}$	$\frac{3.28 \text{ ft/s}}{1 \text{ m/s}}$ $\frac{1 \text{ mi/hr}}{1.61 \text{ km/hr}}$		

## Energy

(US-SI)		(Metric Equivalents)	<b>Joules (J)</b>
$\frac{1 \text{ ft-lb}}{1.36 \text{ J}}$ $\frac{1 \text{ cal}}{4.19 \text{ J}}$ $\frac{1 \text{ BTU}}{1055 \text{ J}}$		$\frac{1 \text{ J}}{1 \text{ N-m}}$ $\frac{1 \text{ J}}{1 \text{ kg-m}^2/\text{s}^2}$	

## Power

(US-Metric)	(Metric Conversion)	(Metric Equivalents)	<b>Watts (W)</b>
$\frac{1 \text{ hp}}{746 \text{ W}}$ $\frac{1.34 \text{ hp}}{1 \text{ kW}}$	$\frac{1000 \text{ W}}{1 \text{ kW}}$	$\frac{1 \text{ W}}{1 \text{ J / s}}$ $\frac{1 \text{ W}}{1 \text{ N-m/s}}$	

<b>Metric Prefixes</b>	10 <sup>12</sup>	10 <sup>9</sup>	10 <sup>6</sup>	10 <sup>3</sup>	10 <sup>-2</sup>	10 <sup>-3</sup>	10 <sup>-6</sup>	10 <sup>-9</sup>	10 <sup>-12</sup>
	T	G	M	k	c	m	μ	n	p
	Tera	Giga	Mega	kilo	centi	milli	micro	nano	pico

## Temperature Conversion

Fahrenheit	Celsius	Kelvin
$^{\circ}\text{F} = \frac{9}{5} \times ^{\circ}\text{C} + 32$	$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$	$\text{K} = ^{\circ}\text{C} + 273$

$^{\circ}\text{F}$	$^{\circ}\text{C}$	K	$^{\circ}\text{F}$	$^{\circ}\text{C}$	K	$^{\circ}\text{F}$	$^{\circ}\text{C}$	K
-459.4	-273	0	39.2	4	277	147.2	64	337
-441.4	-263	10	42.8	6	279	150.8	66	339
-423.4	-253	20	46.4	8	281	154.4	68	341
-387.4	-233	40	50	10	283	158	70	343
-351.4	-213	60	53.6	12	285	161.6	72	345
-315.4	-193	80	57.2	14	287	165.2	74	347
-279.4	-173	100	60.8	16	289	168.8	76	349
-243.4	-153	120	64.4	18	291	172.4	78	351
-207.4	-133	140	68	20	293	176	80	353
-171.4	-113	160	71.6	22	295	179.6	82	355
-135.4	-93	180	75.2	24	297	183.2	84	357
-99.4	-73	200	78.8	26	299	186.8	86	359
-63.4	-53	220	82.4	28	301	190.4	88	361
-22	-30	243	86	30	303	194	90	363
-18.4	-28	245	89.6	32	305	197.6	92	365
-14.8	-26	247	93.2	34	307	201.2	94	367
-11.2	-24	249	96.8	36	309	204.8	96	369
-7.6	-22	251	100.4	38	311	208.4	98	371
-4	-20	253	104	40	313	212	100	373
-0.4	-18	255	107.6	42	315	215.6	102	375
3.2	-16	257	111.2	44	317	219.2	104	377
6.8	-14	259	114.8	46	319	222.8	106	379
10.4	-12	261	118.4	48	321	226.4	108	381
14	-10	263	122	50	323	230	110	383
17.6	-8	265	125.6	52	325	233.6	112	385
21.2	-6	267	129.2	54	327	237.2	114	387
24.8	-4	269	132.8	56	329	240.8	116	389
28.4	-2	271	136.4	58	331	244.4	118	391
32	0	273	140	60	333	248	120	393
35.6	2	275	143.6	62	335	251.6	122	395

## Density

SI Units	kg / m <sup>3</sup>
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General Units	g / cm <sup>3</sup>	g / mL
	solid	liquid

Density = mass / volume

Note: 1 cm<sup>3</sup> = 1 mL

$$d = m / V$$